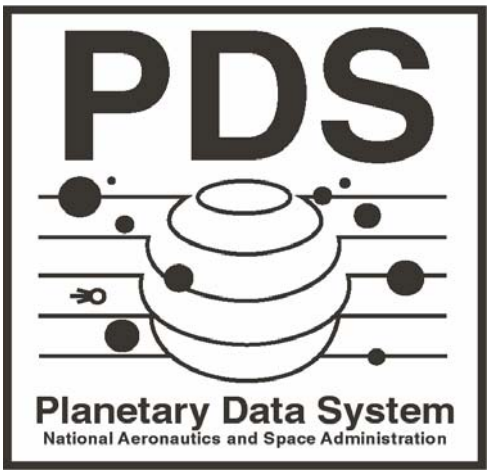
# Planetary Data System

# Installation and Verification System Release D03.4

**December 14, 2005**

**Version 1.1**

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# CHANGE LOG

| Revision | Date | Description | Author |
|---|---|---|---|
| 0.051209 | Dec 09, 2005 | Initial draft. | S. Hardman,<br>J. Wang |
| 1.0<br>1.1 | Dec 09, 2005<br>Dec 14, 2005 | Cleaned up some formatting.<br>Added a step for the procedure to upgrade Tomcat. | S. Hardman<br>J. Wang |

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# 1.0 INTRODUCTION

The Planetary Data System (PDS) Engineering Node (EN) is responsible for design, development and deployment of PDS system capabilities.

## 1.1 Purpose

The purpose of this document is to provide a description for installation and verification of the new or modified capabilities that comprise the current system release.

## 1.2 Scope

This document covers the D03.4 system release, which is scheduled for deployment in December 2005.

## 1.3 Audience

This document is written primarily for those who will be impacted by the release described in this document. The expected audience includes:

- PDS Engineering Node (EN) Staff
- PDS Discipline Node Staff

## 1.4 Applicable Documents

[1] Planetary Data System (PDS) Release Description Document (RDD) System Release D03.4, Version 1.0, Dec. 9, 2005.

# 2.0 INSTALLATION

The procedures for installing the capabilities contained in this release are detailed in this section. There is no installation dependency between the two capabilities. They may be installed in any order.

## 2.1 Resource Manager

Installation of the Resource Manager application will follow the EN's procedure for installing web applications. The following steps must be performed in order to complete the installation. Switch to the *root* user prior to running the commands. Due to the load-balanced configuration, the web application must be installed on both *pdsdlb1* and *pdsdlb2* machines.

1) Install the web application.

   a. Copy the web application files into the following directory (/usr/local/tomcat5/webapps/ROOT/catalog_tools/).

   b. Ensure the existence of the following directory (/usr/local/tomcat5/webapps/ROOT/WEB-INF/classes/catalog_tools/).

   c. Compile the *ADMSession* class with the following command:

      [root@pdsdlbX] **cd /usr/local/tomcat5/webapps/ROOT/catalog_tools**
      [root@pdsdlbX] **./compile.sh**

   d. Restart the Tomcat Server with the following command:

      [root@pdsdlbX] **/etc/init.d/pds restart**

## 2.2 PDS Data Distribution (PDS-D)

Installation of the PDS-D upgrade at the EN involves upgrading the Application Server and the Product Server.

### 2.2.1 Application Server

This section details the procedure for upgrading the EN Application Server.

The following table lists the software dependencies:

| Software | Version |
|---|---|
| J2SE Development Kit (JDK) | 1.4.2_09 |
| Apache Tomcat Server | 5.5.9 |
| PDS-D Central Server | 2.1.0 |

| | |
|---|---|
| PDS-D Profile Server | 1.0.3 |

The following steps must be performed in order to complete the upgrade. Switch to the *root* user prior to running the commands. Due to the load-balanced configuration, the software must be installed on the *pdsdlb1* and *pdsdlb2* machines.

1) Shutdown the PDS software.

   a. Shutdown the Server Manager, Tomcat Server, Name Server and Profile Servers processes with the following command:

      [root@pdsdlbX] **/etc/init.d/pds stop**

   b. Make sure all of the Java processes are dead with the following:

      [root@pdsdlbX] **killall java; sleep 3; killall -9 java**

2) Verify and/or upgrade Java.

   a. Check and verify that the appropriate version of the J2SE Development Kit (JDK) is installed on the target machine with the following command:

      [root@pdsdlbX] **/usr/java/jdk/bin/java -version**

   b. If the version is not 1.4.2_09, download the appropriate version from http://java.sun.com/. Install the software and create the symbolic link */usr/java/jdk* which points to the new installation.

   c. Set the JAVA_HOME environment variable with the following command:

      [root@pdsdlbX] **export JAVA_HOME=/usr/java/jdk**

3) Upgrade the PDS-D Central Server and Profile Server software.

   a. Download the pds-cn and pds-profle packages from the OODT web site (http://oodt.jpl.nasa.gov/pds-cn/, http://oodt.jpl.nasa.gov/pds-profile/).

   b. Un-tar the downloaded binaries and create the */usr/local/pds* and */usr/local/pds-profile* symbolic links accordingly.

   c. Modify */etc/init.d/pds* by replacing the definition of JAVA_HOME as JAVA_HOME=${JAVA_HOME:-/usr/java/jdk}.

4) Upgrade the Apache Tomcat Application Server.

   a. Download Tomcat Server version 5.5.9 from http://tomcat.apache.org/.

b. Install the package and create the symbolic link */usr/local/tomcat5,* pointing to the location of the new installation.

c. Modify the */usr/local/tomcat5/conf/server.xml* configuration file to change the non-SSL Connector port number from 8080 to 80.

d. Modify the */usr/local/tomcat5/conf/web.xml* file by un-commenting the blocks containing the invokers (e.g. <sevlet> and <servlet-mapping>).

e. Start up the Tomcat server with the following command:

[root@pdsdlbX] **/usr/local/tomcat5/bin/startup.sh**

f. Verify that the local Tomcat main page is displayed at http://pdsdlbX/.

g. Shutdown the Tomcat server with the following command:

[root@pdsdlbX] **/usr/local/tomcat5/bin/shutdown.sh**

h. Edit /etc/rc.d/init.d/tomcat5 script and ensure that the CATALINA_OPTS environment variable contains the following options:

- -Djpl.oodt.servlets.ProductServlet.preferredNamespace=urn:eda:rmi:
- -Xms256m
- -Xmx512m
- -Daliases=/usr/local/pds/etc/aliases.properties

5) Migrate the PDS web applications to the new Tomcat Server.

a. Copy web application files and/or directories and their dependencies from the old Tomcat directory over to the new Tomcat environment using the following mapping (all locations are under the Tomcat installation directory):

| Old Location | New Location |
|---|---|
| webapps/db | webapps/db |
| webapps/dsstatus | webapps/dsstatus |
| webapps/pds-explorer | webapps/pds-explorer |
| common/lib/jconn2.jar | common/lib/jconn2.jar |
| conf/Catalina/localhost/dsviewdb.xml | webapps/ROOT/META-INF/context.xml<br><br>** META-INF is a new directory. context.xml file has a different layout to dsviewdb.xml. See appendix A |
| webapps/ROOT/dtd/ | webapps/ROOT/dtd/ |
| webapps/ROOT/pds/ | webapps/ROOT/pds/ |

| | |
|---|---|
| webapps/ROOT/xsl/ | webapps/ROOT/xsl/ |
| webapps/ROOT/WEB-INF/ | webapps/ROOT/WEB-INF/ |
| webapps/ROOT/tst.html | webapps/ROOT/tst.html |
| webapps/ROOT/catalog_tools | webapps/ROOT/catalog_tools<br><br>** this assumes that the Resource Manager has already been installed |

b. Synchronize jar file and class file dependencies with the ones used by the Profile Servers. This is very important, if not completed, the portions of the software communicating with the Profile Servers will not work. The following table describes the location of jar files or class files that each depend on and their locations. The version numbers are based on the current version at the time this document was written.

| **Application name** | **jar/class file location related to Tomcat installation root** | **jar/class file names** |
|---|---|---|
| Basic Browser | webapps/db/WEB-INF/lib | edm-commons-2.2.9.jar<br>edm-query-2.0.6.jar<br>grid-product-3.0.8.jar<br>grid-profile-3.0.6.jar<br>grid-query-3.0.3.jar<br>jconn2-5.5.jar<br>jena-1.6.1.jar<br>junit.jar<br>mysql-connector-java-3.0.15-ga-bin.jar<br>pds-utils-1.0.1.jar |
| DS Status | webapps/db/dsstatus/WEB-INF/lib | jconn2-5.5.jar<br>pds-utils-1.0.1.jar |
| DS View | webapps/ROOT/WEB-INF/lib | catalina-root.jar<br>edm-commons-2.2.9.jar<br>edm-query-2.0.6.jar<br>grid-product-3.0.8.jar<br>grid-profile-3.0.6.jar<br>grid-query-3.0.3.jar<br>jconn2-5.5.jar<br>jena-1.6.1.jar<br>junit.jar<br>mysql-connector-java-3.0.15-ga-bin.jar<br>oracle.jar<br>pds.jar<br>pds-utils-1.0.1.jar<br><br>** pds.jar is a PDS EN generated jar file |

| | | |
|---|---|---|
| PDS Explorer | webapps/pds-explorer/WEB-INF/lib | edm-commons-2.2.9.jar<br>edm-query-2.0.6.jar<br>grid-product-3.0.8.jar<br>grid-profile-3.0.6.jar<br>jconn2-5.5.jar<br>pds-utils-1.0.1.jar |
| Resource Manager | webapps/ROOT/WEB-INF/classes/catalog_tools | ADMSession.class<br><br>** this class file is generated by running compile.sh script inside the catalog_tools application directory |

c. Start up the Server Manager, Tomcat Server, Name Server, and all Profile Servers with the following command:

[root@pdsdlbX] **/etc/init.d/pds start**

### 2.2.2 Product Server

This section details the procedure for upgrading the EN Product Server.

The following table lists the software dependencies:

| **Software** | **Version** |
|---|---|
| J2SE Development Kit (JDK) | 1.4.2_09 |
| PDS-D Product Server | 2.0.1 |

The following steps must be performed in order to complete the upgrade. Switch to the *root* user prior to running the commands. Due to the load-balanced configuration, the web application must be installed on the *pdsarch1* and *pdsarch2* machines.

1) Shutdown the PDS software.

a. Shutdown the Server Manager and Product Server processes with the following command:

[root@pdsarchX] **/etc/init.d/pds stop**

b. Make sure all of the Java processes are dead with the following command:

[root@pdsarchX] **killall java; sleep 3; killall -9 java**

c. Check to make sure everything was killed off with the following command:

[root@pdsarchX] **ps auxww | egrep 'launcher|java'**

If any processes remain, kill them off with the *kill -9* command.

2) Verify and/or upgrade Java.

a. Check and verify that the appropriate version of the J2SE Development Kit (JDK) is installed on the target machine with the following command:

[root@pdsarchX] **/usr/java/jdk/bin/java -version**

b. If the version is not 1.4.2_09, download the appropriate version from http://java.sun.com/. Install the software and create the symbolic link */usr/java/jdk* which points to the new installation.

c. Set the JAVA_HOME environment variable with the following command:

[root@pdsarchX] **export JAVA_HOME=/usr/java/jdk**

d. Create a symbolic */usr/java/j2sdk* to set up the Launcher to start up the Product Server when needed:

[root@pdsarchX] **cd /usr/java; ln –s j2sdk1.4.2_09 j2sdk**

3) Verify network availability.

a. Check and verify that port 7576 is open and accepting network connections with the following command from another machine:

[root@other] **telnet pdsarchX 7576**

b. If an error occurs, ask your system administrator to allow external access to port 7576.

4) Upgrade the PDS Product Server software.

a. Download the Linux version of PDS-D Product Server software from the OODT web site http://oodt.jpl.nasa.gov/pds-ps-linux-rpm/ and un-tar the downloaded binary file.

b. Follow instructions found in the INSTALLATION and README.txt files, which are part of the download package. The Product Server binary is contained in an RPM package. Run the following command to install the binary:

[root@pdsarchX] **env PRODUCT_DIR=/archive PDS2JPEG=/usr/local/bin/pds2jpeg rpm -i --nodeps <rpm file name>**

Note: If there is already an older version of the Product Server RPM

installed on the system, perform the following to remove the old installation and then install the new binary:

[root@pdsarchX] **rpm -e <old rpm file name>**
[root@pdsarchX] **env PRODUCT_DIR=/archive PDS2JPEG=/usr/local/bin/pds2jpeg rpm -i --nodeps <new rpm file name>**

c. Start up the Product Server with the following command:

[root@pdsarchX] **/etc/init.d/pds start**

5) Verify configuration of the newly installed HTTP-based Product Server.

a. Access the configuration page at http://pdsarchX:7675/pds/ with "pds" configured as the name of the HTTP-based Product Server web application. The following two system properties must be entered on the configuration web page under System:

| **Key** | **Value** |
|---|---|
| jpl.pds.server.JPEGFileHandler.pds2jpeg | /usr/local/bin/pds2jpeg |
| jpl.pds.server.FileQueryHandler.productDir | /archive |

b. If changes were made to the configuration, restart the Product Server with the following command:

[root@pdsarchX] **/etc/init.d/pds restart**

c. Configure the Application Server (*pdsdlb1* and *pdsdlb2*) with the mapping of the old/new EN Product Server references. This will allow backward compatibility. The following line was added to the */usr/local/pds/etc/aliases.properties* file:

urn\:eda\:rmi\:PDS.CN.Product=http\://pdsarchX.jpl.nasa.gov:7576/pds/prod

d. Restart the Server Manager, Tomcat Server, Name Server, and all Profile Servers with the following command:

[root@pdsdlbX] **/etc/init.d/pds restart**

# 3.0 VERIFICATION

The verification steps for the newly installed capabilities are described in this section. Each set of procedures can be run independently.

## 3.1 Resource Manager

1) Open http://pdsdlbX.jpl.nasa.gov/catalog_tools
2) Log in as a PDS Subscriber
3) Choose a data set identifier and the result list should be displayed
4) Click the Template button, a blank template should be displayed. Click Cancel to exit. Note: do not fill in and submit any test template at this point because the application is connecting to the production catalog.

## 3.2 PDS Data Distribution (PDS-D)

### 3.2.1 Application Server

The goal of verification on the application server is to ensure that PDS-D applications and supporting Profile Servers function correctly after the upgrade of Java, Tomcat, PDS-D Central Server and PDS-D Profile Server.

Application Name: Basic Brower

1) Open http://pdsdlbX.jpl.nasa.gov/db/servlet/DbSearchServlet?DATA_SET_ID=ODY-M-SPICE-6-V1.0
2) Specified a search criteria and click “Go!” to obtain a result product list
3) Click any View Label link to view a label file

Application Name: Data Set Status

1) Open http://pdsdlbX.jpl.nasa.gov/dsstatus/
2) Select columns to display, and submit a search. This should result a list of data set id and related information.
3) Specify different sorting options, submit queries, and checked results.

Application Name: DS View

1) Open http://pdsdlbX.jpl.nasa.gov/pds/
2) Specified “2001 Mars Odyssey” as Mission Name and click “Go!” to obtain a result list
3) Click “View Information for” at any one line of result row, the view dataset page was displayed.

4) Click links behind parameters and detailed information page should be displayed.

Application Name: PDS Explorer

1) Open http://pdsdlbX.jpl.nasa.gov/pds-explorer
2) Click each selection tab to verify the display match the selection.
3) Choose “Node Collection”, a list of PDS Nodes should be listed on the left-hand side.
4) Clicked NAIF, a list of dataset ids are listed.
5) Select any dataset id, and drill down the link for each volume to list or view products.

Application Name: PDSQuery

1) Open http://pdsdlbX.jpl.nasa.gov/query?Identifier=EAR-A-5-DDR-RADARSHAPE-MODELS-V1.1:RSHAPES-4769CASTALIA-200006&resclass=data.product
2) Product information should be displayed.

### 3.2.2 Product Server

The goal of Product Server verification is to ensure successful communication with the new EN Product Server, both through direct URL interface to the EN Product Server system pdsarchX or via the naming registry on pdsdlbX.

The following URLs should return the same PDS Label as found in Appendix B (adjust the host name accordingly).

1) http://pdsarchX.jpl.nasa.gov:7576/pds/prod?q=OFSN+%3D+/data/near-a-msi-3-edr-cruise1-v1.0/nicru1_2002/data/1996/051/rad/m0000257526f1_2p_rad.lbl+AND+RETURN_TYPE+%3D+PDS_LABEL

2) http://pdsdlbX.jpl.nasa.gov/prod?object=PDS.CN.Product&keywordQuery=OFSN+%3D+/data/near-a-msi-3-edr-cruise1-v1.0/nicru1_2002/data/1996/051/rad/m0000257526f1_2p_rad.lbl+AND+RETURN_TYPE+%3D+PDS_LABEL

# APPENDIX A CONTENT.XML EXAMPLE

Contents of the context.xml:

```
<!--
   Context configuration file for the DS View Web App
   containing database and server information

   context.xml 2005/08/01
-->

<Context cookies="true" docBase="/usr/local/tomcat5/webapps/ROOT" path="">
  <Resource name="jdbc/pdsprofile"
          auth="Container"
          type="javax.sql.DataSource"
          username="user"
          password="password"
          driverClassName="com.sybase.jdbc2.jdbc.SybDriver"
          url="jdbc:sybase::Tds:dbserver.jpl.nasa.gov:4100/catalogdb"/>
</Context>
```

# APPENDIX B PDS LABEL RESULT

```
PDS_VERSION_ID              = PDS3
RECORD_TYPE                 = FIXED_LENGTH
RECORD_BYTES                = 2880
FILE_RECORDS                = 186

^HEADER                     = "M0000257526F1_2P_RAD.FIT"
^IMAGE                      = ("M0000257526F1_2P_RAD.FIT", 5)

DATA_SET_ID                 = "NEAR-A-MSI-3-EDR-CRUISE1-V1.0"
INSTRUMENT_HOST_NAME        = "NEAR EARTH ASTEROID RENDEZVOUS"
INSTRUMENT_NAME             = "MULTI-SPECTRAL IMAGER"
INSTRUMENT_ID               = MSI

/***** PRODUCT INFORMATION *****/
PRODUCT_ID                  = "M0000257526F1_2P_RAD.FIT"
SOURCE_PRODUCT_ID           = ( "M0000257526F1_2P.FIT",
                            "SEE MSI_C_FLAT.PRO",
                            "N/A",
                            "N/A",
                            "DARK_MODEL_V4.TAB" )
PROCESSING_HISTORY_TEXT     = "RAD"
PRODUCT_VERSION_ID          = "1.0"
PRODUCER_FULL_NAME          = "Scott L. Murchie"
PRODUCT_CREATION_TIME       = 2001-08-24T14:26:10.000
SOFTWARE_NAME               = "RECAL"
SOFTWARE_VERSION_ID         = "1.0"
PARAMETER_NAME              = "Cal coefficients ver 3"
FLAT_FIELD_CORRECTION_FLAG  = TRUE
DARK_CURRENT_CORRECTION_FLAG = TRUE
DATA_QUALITY_ID             = 20000000
DATA_QUALITY_DESC           = "
  DATA_QUALITY_ID fields are defined in the MSIDS.CAT."

/***** TIME INFORMATION    *****/
START_TIME                  = 1996-02-20T20:15:35.643
STOP_TIME                   = 1996-02-20T20:15:35.646
SPACECRAFT_CLOCK_START_COUNT = 257526.916
SPACECRAFT_CLOCK_STOP_COUNT  = 257526.919

/***** OBSERVATION INFORMATION    *****/
EXPOSURE_DURATION           = 3.00 <ms>
EXPOSURE_TYPE               = "MANUAL"
COMMANDED_FILTER_NUMBER     = 1
FILTER_NUMBER               = 1
FOCAL_PLANE_TEMPERATURE     = 243.58 <K>
INSTRUMENT_TEMPERATURE      = ( 289.72 <K> , 284.09 <K> )
SEQUENCE_TABLE_ID           = 4
SEQUENCE_TITLE              = "Moon1"
INST_CMPRS_QUANTZ_TBL_ID    = 0

/***** IMAGE INFORMATION    *****/
PIXEL_GEOMETRY_CORRECTION_FLAG= N
```

```
LINE_DISPLAY_DIRECTION       = UP
SAMPLE_DISPLAY_DIRECTION     = RIGHT

/***** GEOMETRY VALUES    *****/
RIGHT_ASCENSION              =  51.2252627036007480 <deg>
DECLINATION                  =  14.5606986372006002 <deg>
CELESTIAL_NORTH_CLOCK_ANGLE   = 193.7835046112252500 <deg>
CENTER_LATITUDE              = "UNK"
CENTER_LONGITUDE             = "UNK"
COORDINATE_SYSTEM_CENTER_NAME = SUN
EMECL_SC_QUATERNION          = (  0.5086370729623960, -0.7374250901610959,
                        -0.2670648124438781, -0.3552026891275772 )
SUN_SC_POSITION_VECTOR  = ( 0.000, 0.000, 0.000 )
TARGET_NAME                  = "MOON"
TARGET_CENTER_DISTANCE       =  147588607.4 <km>
SLANT_DISTANCE               = "UNK"
HORIZONTAL_PIXEL_SCALE       = 14057.827039 <km>
VERTICAL_PIXEL_SCALE         = 23756.295062 <km>
INCIDENCE_ANGLE              = "UNK"
EMISSION_ANGLE               = "UNK"
PHASE_ANGLE                  = "UNK"

OBJECT                    = HEADER
  BYTES                   = 11520
  HEADER_TYPE             = FITS
  INTERCHANGE_FORMAT      = BINARY
  RECORDS                 = 4
  DESCRIPTION             = "
  FITS format defined in NASA/Science Office Standards Technology 100-1.0.
  Parameter definitions are in /DOCUMENT/INSTRUMENT/MSIDEFINITIONS.TXT."
END_OBJECT                = HEADER

OBJECT                    = IMAGE
  LINES                   = 244
  LINE_SAMPLES            = 537
  SAMPLE_BITS             =  32
  SAMPLE_TYPE             = IEEE_REAL
  OFFSET                  =  0
  MEAN                    =    -0.126410
  STANDARD_DEVIATION      =     0.702780
  MINIMUM                 =    -2.13218
  MAXIMUM                 =     38.5494
  PIXEL_SATURATION_VALUE  = "N/A"
  SATURATED_PIXELS        =    0
END_OBJECT                = IMAGE

END
```